APPENDIX C - PROCESS SPECIFICATION REPORT

1.2 SPATIAL CAPABILITY

The purpose of this module is to facilitate and enhance BLM's ability to view and process case data. The system will link alphanumeric data to spatial coordinate data. System goal is to provide capabilities that will make it possible, but not mandatory to process cases using spatial techniques.

Capabilities:

    1.2.1   Build and Access Spatial Reference Themes.
    1.2.2   Import Land Data.
    1.2.3   Maintain Land and Mineral Data (Combined in Sec. 1.2.2).
    1.2.4   Process Spatial Queries and Display.
    1.2.5   Generate Cartographic Products.
    1.2.6   Export ALMRS Spatial Data.

Design Constraints: Refer to Appendix J.

APPENDIX C - PROCESS SPECIFICATION REPORT

1.2.1 BUILD AND ACCESS SPATIAL REFERENCE THEMES

Capability:

The primary objective of providing access to spatial reference themes is to display case information spatially where such capability is lacking within ALMRS. Spatial reference themes that meet this objective are either geo-referenced or geo-related. Geo-referenced themes are raster images and vector coverages that contain earth coordinates. Geo-related themes are digital images, CAD drawings, or cartograms without earth coordinates, but whose nominal location is a modeled ALMRS entity.

Where the Land Theme (GCDB) does not contain sufficient coordinates in a given township to display a case boundary as a point, line or polygon, geo-referenced themes must be available. The ALMRS Record Mantainer and Geographic Maintainer need to import cordinates from sources other than GCDB when case legal descriptions cite unsurveyed features such as rivers and roads in order to display all serialized cases in the township. These Maintainers also need to modify existing case boundaries and create new case boundaries in order to see new spatial relationships given potential case actions involving unsurveyed legal descriptions of pre-serialized cases. Where the Land Theme is entirely lacking in a given township all ALMRS users need access to available geo-related themes that display appropriate land and mineral information.

The secondary objective is to enhance all ALMRS users' ability to relate ALMRS case information, both alpha-numeric and spatial, with the wide range of thematic data contributed by many disciplines and available in various digital formats.   In the manual process of case adjudication, hardcopy maps, plats, reports, photos, legal instruments and other sources of information are collected, consulted, and sometimes reproduced to document decisions. 1.2.1 meets this same need in the ALMRS windows environment where and when such reference themes are available in data stores inside and outside of ALMRS. Spatial reference themes meeting this objective may be geo-referenced, geo-related, or case related.

This section describes processes by which ALMRS users are informed of the availability of spatial reference themes and methods by which the themes shall be accessed when created, maintained and stored outside of ALMRS. This section also describes the process by which geo-related and case-related themes shall be created, maintained, stored and accessed within ALMRS. See sections 1.2.4 and 1.2.5 for the display and production requirements of all spatial reference themes..

The process of determining appropriate reference themes, scales, and establishing pathways to their locations when outside of ALMRS shall be the responsibility of the Geographic Maintainer. The Geographic Maintainer shall be responsible for the creation, maintainance, and storage of geo-related themes within ALMRS and for establishing pathways to their locations. The Geographic Maintainer and ALMRS Record Maintainer shall be responsible for the creation, maintainance, and storage of case related themes. Access to case related themes shall be established by the Geographic Maintainer.
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See Appendices J.1 and J.5 for a list of import sources and formats. Imported reference themes shall include a metadata and transaction information that adheres to the FGDC Spatial METADATA Content Standard in order to track thematic data processing quality and lineage.

Clarifications:

 1.The Geographic Maintainer may at any time replace pathways to existing reference themes with pathways to more appropriate reference themes of higher accuracy or more detail. ALMRS Records Maintainers or other ALMRS users, who have copied and saved to their personal work spaces,reference themes in total or in part, are responsible for updating these personal project files.

2.The spatial reference themes shall be accessed from a variety of sources outside of ALMRS including, but not limited to GIS libraries and network storage devices such as CD-ROM juke boxes.

3.Geo-related reference themes, such as scanned MTPs, HI pages, cadastral plats and notes, shall be linked to appropriate modeled ALMRS entities such as townships or sections.

APPENDIX C - PROCESS SPECIFICATION REPORT

4. ALMRS users shall be informed of the scale, projection, datum, age, and other appropriate meta data pertaining to all spatial reference themes.

5. Storage of reference themes is considered an implementation issue, thus, mention of storage "inside" or "outside" ALMRS in this section preliminary.

Future Enhancements:

1.Future versions of ALMRS will have to support many additional reference themes.

2.Future versions of ALMRS could allow for spatial representation of historical reference themes.

APPENDIX C - PROCESS SPECIFICATION REPORT

1.2.1.1 ACCESS GEO-REFERENCED SPATIAL THEMES

Capability:

Geo-referenced spatial themes shall be used by the Geographic Maintainer and ALMRS Record Maintainer as sources of coordinates to Create Land by Extraction from other Sources (1.2.2.2.1) By definition, geo-referenced themes contain earth coordinates. Appropriate geo-referenced themes shall include, but are not limited to, hydrography, hypsography (contours), transportation, PLS, and geo-political boundaries not available within ALMRS.

Geo-referenced spatial themes shall be used by all ALMRS users as background reference themes upon which existing ALMRS spatial themes shall be displayed. Examples of geo-referenced themes utilized in this manner include, but are not limited to, Digital Raster Graphs, digital orthophoto quads, shaded relief GIS resource coverages, and satellite imagery. Geographic names from the Geographic Names Information System (GNIS) is another appropriate geo-reference theme.

The creation, maintainance, and storage of geo-referenced themes shall be accomplished outside of ALMRS. Therefore, the capability required here is one of notification and access.

The Geographic Maintainer shall establish pathways to sources of geo-referenced themes outside of ALMRS. All ALMRS users shall be informed of the availability of all geo-referenced themes within their selected AOI. At a minimum, ALMRS users shall be informed of theme names and scales in a selection window. Selecting the geo-referenced theme activates the pathway.

Clarifications:

1. Geo-referenced spatial themes shall be available within spatially selected AOIs whether ALMRS spatial themes exist or not.

2. Geo-referenced spatial themes shall be rastor or vector and may be single or composite themes.

3. All desktop GIS functionality available for ALMRS spatial themes shall be available for geo-referenced spatial themes accessed from sources outside ALMRS.

4. The Geographic Maintainer shall determine appropriate default projections and original collection scales of geo-referenced themes accessible to ALMRS users. ALMRS users must have the ability to standardize projections involving multiple themes. If the reference theme projection cannot be re-projected (DRG example), then ALMRS themes must be re-projected to match. ALMRS users may display and plot geo-referenced themes at any scale.

APPENDIX C - PROCESS SPECIFICATION REPORT

1.2.1.2 BUILD AND ACCESS GEO-RELATED REFERENCE THEME

Capability:

A geo-related reference theme provides the user with a digital image of a graphic and/or text product related to ALMRS land and mineral records. Geo-related reference themes support ALMRS users in research, adjudication, and and case processing. By definition, geo-related themes do not contain earth coordinates. They are geo-related in that they can be linked to a modeled ALMRS entity, i.e., state, county, government division, Texas tract, township, section, etc. Geo-related themes may be linked to multiple entities and, optionally, to case(s) in the ALMRS Case themes.

Typical geo-related reference themes include, but are not limited to, scanned title and use plats that are either still in use and substitute for ALMRS generated plat types in townships where no spatial coordinates exist or as sources of historical information where the manual records have been retired for a township. Cadastral plats, survey notes, aerial photos, and documents in the Miscellaneous Documents Index are appropriate geo-related themes.

The processes required to build a geo-related reference theme are:

Create Geo-related Reference Theme

This is a document conversion process including:

- Scan analog product creating a standard format image file (e.g. tif)

- Index image using standardized relational data base tables inside ALMRS. These image tables include, but are not limited to, primary key linking image to modeled ALMRS entity, descriptive document attribute(s), optical id, and optical disk location.

- QA/QC image and image index tables.

Maintain/Replace Geo-Related Reference Theme

This process migrates final image files to a retreivable platform. It includes the capability to replace image files and update the index tables, to add image files and append the image tables, and to update the image tables independently of the image files (for example, to add links to additional ALMRS modeled entities) in a maintenance utility..

Access Geo-Related Reference Theme

This process establishes pathways from the user workstation to the retreivable platform where image files are stored and informs the ALMRS user of the existence ot geo-related themes within the selected AOI. The ALMRS user shall see geo-related themes listed in a selection box along with other available ALMRS themes within the AOI. The selection information shall contain, at a minimum, a description of the document type and the modeled entity to which it is linked for each geo-related image within the AOI. Selecting the the geo-referenced theme activates the pathway. See 1.2.4 for display requirements for geo-related reference themes.

Clarifications:

1. The Create and Maintain/Replace capabilities reside outside ALMRS, but the relational data base tables containing the image tables are part of the ALMRS spatial physical model. It is the intent of this requirement to provide a standard template for the index fields within ALMRS in support of imaging projects outside of ALMRS.

2. The ALMRS Geographic Maintainer is responsible for the creation and maintenance of the geo-related reference themes.

APPENDIX C - PROCESS SPECIFICATION REPORT

3. The Miscellaneous Document Index contains legal instruments pertaining to applicable lands within a geo-state, but whose links to specific modeled ALMRS entities below the state level must be interpreted by the ALMRS user. Therefore, ALMRS users must be informed of the Miscellaneous Document reference theme in all selected AOIs within the geo-state.

APPENDIX C - PROCESS SPECIFICATION REPORT

1.2.1.3 BUILD AND ACCESS CASE RELATED REFERENCE THEME

Capability:

The case related reference theme shall contain a wide variety of document types and formats. The objective of this requirement is to provide the ALMRS Records Maintainer (who has permission to create and process a specific ALMRS case) with the ability to build and link reference documents to the case. The concept is one of a virtual case file. The ALMRS Records Maintainer will either create or collect maps, reports, photos, tables, charts, spreadsheets, legal documents, and many other items pertaining to the case, but from outside of ALMRS case processing, and need to associate these to the case for easy reference.

Many of these reference documents will be collected as hard copy products. Original patents and deeds, maps, and photos are examples. The ALMRS Records Maintainer shall have tools available to create digital images of these products, populate index tables with primary keys and attributes, establish pathways to the data stores, and link them to the case.

Other reference documents will already be in digital formats outside of ALMRS case processing. Scanned MTPs, HI pages, and cadastral plats are examples. Word processing documents, spreadsheets, and data bases are examples. The ALMRS Records Maintainer may find web sites on the internet containing information related to the case and need to establish a link to that web site. The ALMRS Record Maintainer shall have the tools to populate index tables with primary keys and attributes, establish pathways to the data stores and sites, and link them to the case.

The processes required to build a case related reference theme are:

Create Case Related Reference Theme

This is a document conversion process including:

- Scan analog product creating a standard format image file (e.g. tif)

- Index image using standardized relational data base tables inside ALMRS. These image tables include, but are not limited to, primary key linking image to the ALMRS case, descriptive document attribute(s), optical id, and optical disk location.

- QA/QC image and image index tables.

Maintain/Replace Case Related Reference Theme

This process migrates final image files to a retreivable platform. It includes the capability to replace image files and update the index tables, to add image files and append the image tables, and to update the image tables independently of the image files (for example, to add links to additional ALMRS cases) in a maintenance utility. This maintenance utility shall provide the capability to index image and digital files collected from sources other than through the Create process above and migrate them to a retreivable platform.

Access Geo-Related Reference Theme

This process establishes pathways from the user workstation to the retreivable platform where case related reference files are stored and informs the ALMRS user of the existence ot case related themes within the selected AOI. The ALMRS user shall see case related themes listed in a selection box through a standard convention such as clicking on the case serial number appearing in a spatial displayI. The selection information shall contain, at a minimum, a description of the document type and the case id or serial number to which it is linked. Selecting the the case releated item activates the pathway. See 1.2.4 for display requirements for the case related reference theme.

APPENDIX C - PROCESS SPECIFICATION REPORT

APPENDIX C - PROCESS SPECIFICATION REPORT

Clarifications:

1. The Create and Maintain/Replace capabilities reside outside of ALMRS, but the relational data base tables are a part of the ALMRS spatial physical model. It is the intent of this requirement to provide a standard template for the index fields within ALMRS in support of imaging projects outside of ALMRS.

2. The ALMRS Geographic Maintainer shall have the same capabilities as the ALMRS Records Maintainer to Build Case Related Reference Theme.

3. No one but the owner of the original document in the Case Related Theme shall have write access to the document.

4. The cases to which the case related reference theme may be linked include pre-serialized, as well as, serialized cases.

5. Access to the case related theme shall be controlled by user profile.